



“ For over a decade Coolspirit have been supplying the UK’s top organisations with storage products and solutions so be assured we will meet your requirements head on.

It’s all about getting things right first time, quickly and simply! ”

Damon Robertson
Coolspirit Ltd

Our address

24 The Bridge Business Centre
Beresford Way
Chesterfield
S41 9FG

Get in touch

Call us on: 01246 454222
Email us: web@coolspirit.co.uk
Find us: [View location map](#)
Web: www.coolspirit.co.uk

Office hours

mon - thurs 8:30am - 5:30pm
fri 8:30am - 5pm
sat - sun Closed

“ Boost your storage buying power...
use ours! ”

Buy with confidence from
Coolspirit your authorised
HP Partner



The dangers of using recycled media white paper



Executive summary.....	2
Would you gamble your company's future on the price of a tape?	2
Secondhand usually means second-rate.....	2
What is recertified media?	2
Recycled media: myths and facts	3
Purchasing a recertified tape.....	7
New media versus recertified media	8
To be certain of your data, buy the brand that is new.....	8
For more information.....	9

Executive summary

Data storage is all about certainty—trusting that data is safe and always recoverable. HP and the storage media industry as a whole have gone to great lengths to deliver that certainty. With soaring data storage costs, the option of discounted, recertified media may look attractive. But what certainty is there in a secondhand tape?

Would you gamble your company's future on the price of a tape?

IT departments are under intense pressure to reduce costs wherever they can and get the maximum return on their investment in equipment and media. So when you are buying tapes in their thousands, it is tempting to try and re-use any that contain obsolete data by degaussing them—or even to buy degaussed tapes at reduced prices. But this is taking a substantial risk.

HP and other media manufacturers consistently stress the dangers of taking any chances at all with storage media—only to be challenged by some rather dubious claims on the part of companies who sell it.

Secondhand usually means second-rate

Buying recertified media is like buying a used car with no service history. The test certificate, just like a certificate of roadworthiness for a vehicle, is no guarantee of reliable, everyday performance when driven to extremes. If your car breaks down, you might be stuck for awhile before help arrives to get you home. If your media breaks down, you could go out of business.

What is recertified media?

Recertified media is used media that has been bought as scrap, revitalized, and cleaned up to look as good as new. Recertification may use a process called degaussing, which erases data from magnetic tapes. Other methods involve rewriting over the existing data. These methods are essential to declassify information for security purposes or to conform to privacy laws so that tapes can be disposed of safely. It is unwise, however, to use it as a convenient solution for getting less expensive tapes.

While some recertified tapes may perform adequately in most datacenter environments, trusting your data to someone else's castoffs is a big risk to take. There are too many unknowns. You might save a few dollars on the price of the cartridge, but a rogue cartridge and one failure could cost your datacenter thousands more.

Unlike the certificate for used cars, media recertification does not follow an industry-standard procedure. And, unlike a new cartridge, recertified media is not always blank. Cartridges can be degaussed to erase data, but not all degaussers will erase all of the data on the cartridge. In certain areas—for example, California—accidental disclosure of data carries severe financial penalties.

Moreover, if you degauss a high-capacity media such as Ultrium, you will also wipe the factory-written servo pattern—the markers that help to keep the drive accurately positioned during recording.

So what are the test criteria for recertification? Is one company's recertified media better than anyone else's? And, who knows what these tapes have been through in the past? Even the most rigorous recertification cannot possibly tell you what the media has been exposed to during its life. You may be one of those companies that takes proper care of its media. Was the previous owner as careful? Or, has the media degraded enough to be an accident waiting to happen?

It is time to set the record straight and challenge the extravagant claims used tape dealers make to persuade you to buy their products.

Recycled media: myths and facts

Used tape dealer: Manufacturers typically offer a long warranty period on their new tapes. To suggest that the new tape will last for many years in the hands of one owner but would not last as long if it changes hands does not engender much faith in the manufacturer's product.

HP: As a responsible media manufacturer, it is the duty of HP to make customers aware of the dangers of introducing unknowns into their storage environment. Users and resellers cannot know for certain in what conditions used tapes have previously been stored or used. Rudimentary testing by a recycling vendor will not reveal how suitable the tape is for re-use.

Given that corporate information is so precious, why would anyone trust it to a tape with an unknown past? Why take unnecessary risks with information, when you can buy new, exhaustively tested media that comes with a lifetime warranty?

Used tape dealer: The tape has a specific warranty period. If it is a quality product and as long as the datacenter maintains a suitable environment, it should last for that long no matter how many owners it has had.

HP: This would be true if recycled tape media were to degrade in a linear fashion, like a print cartridge does, which of course it does not. Many factors determine the usable life of a cartridge—environmental conditions, usage patterns, the condition of the tape drive, and so on. Moreover, introducing a used tape into an unfamiliar environment or duty cycle could actually increase its demise, because the tape drive has been conditioned to expect a certain type of media—just as pale or sensitive skin will burn if suddenly exposed to strong sunlight.

A used tape is a worn tape. No amount of cosmetic surgery will ever make it as good as new. Referring to the car analogy, if you put a used tire from a low-mileage car on a higher mileage car, you are taking a risk. Partly worn tires, though legal, will never be as good as brand new ones. The same is true of tape media.

Used tape dealer: But you say that media exposed to environments outside recommended specs can still be used if it is properly reacclimatized. In any event, our recertification process will discover any damage and the tape will not be sold.

HP: Nowhere does HP state that media should be reacclimatized. As far as HP knows, no other manufacturer does either. What HP does say is that when bringing tapes out of extreme environments, it is important to give them a chance to get used to the change in temperature or humidity.

It is puzzling how a company that is apparently prepared to buy tapes from anywhere and anyone—even offering to pay shipping costs to get their hands on them—says that it will reject any that are unfit for resale.

It is also unclear what your thresholds are for pass and fail? Are you prepared to publish specific information about your test programs and results, as HP and other media manufacturers do? HP does this so that customers can make their own, informed decisions about which brand to buy, and weigh for themselves the risks of buying secondhand media.

Used tape dealer: The tape that we recertify comes from state-of-the-art datacenters that carefully manage their equipment and media assets.

HP: What exactly is a state-of-the-art datacenter? Datacenters are living, dynamic, fluid environments, not museums or design emporiums. From the perspective of media usability and handling, they are the most stressful and demanding environments on earth. The suggestion that busy IT staff will handle their media assets like fine porcelain is a distortion of the truth.

Tape media in a datacenter lives in gigantic silos. It gets loaded and unloaded by robust automation systems hundreds of times a week, and is moved on and off site, in all weathers, between the datacenter and the vault. This is something it is designed for but there are limits. With a recycled tape, how do you know those limits have not been surpassed?

Used tape dealer: We do not accept physically damaged media—and even tapes with more than slight cosmetic blemishes are disqualified for use during our recertification process.

HP: Cartridges fall into the hands of recertifiers because they either:

1. Experience “early life failure” due to physical damage or exposure to some type of debris or contaminant, resulting in unacceptable error performance.
2. Become obsolete because they are incompatible with a new tape drive.

Customers cannot possibly tell which of these applies to the recertified tape they buy—and used tape dealers cannot tell the quality of a tape cartridge by looking at it. During recertification, how many drives do they test the cartridge on? How many tests do they carry out? What are the benchmarks for determining whether the tape is usable or not? A pristine tape may look perfect but be completely unusable or unsound in the drive.

Used tape dealer: We certify our tapes on IBM, STK, Quantum, and other drives using software developed to test against higher error performance criteria than industry standards dictate.

HP: Industry standards such as Ultrium do not stipulate error performance criteria. The logo specification confirms that any manufacturer’s Ultrium will work in any other manufacturer’s Ultrium drive.

So what error performance criteria are used tape dealers referring to? In how many environments are these so-called criteria applied? After all, a tape that offers reasonable error performance in a cold, dry environment could fail a similar test in a warm, humid environment.

What kind of performance extremes—load/unload, shoeshine, and so on—are these error thresholds measured against? And what tests would be conducted on the servo pattern for an Ultrium tape?

You will not find the answers to these fundamental questions on a used tape dealer’s website.

Used tape dealer: Any data left on the tape is not usable or readable. After all, old, unreadable data exists in every overwritten tape cartridge in every datacenter in the world. We also accept many obsolete cartridges as well.

HP: How is this “left data” unreadable or unusable? What happens to the data that the used tape dealer removes? Is it destroyed securely by an auditable process?

Used tape dealer: As stated already, **all** tapes are put through a stringent recertification process. Since many new tapes are only “batch tested,” our testing process typically provides a higher level of quality than for many newly manufactured tape cartridges. We pay a premium price to buy media back and recertify it. The manufacturer is only in the business of providing new media and is not interested in providing intelligent asset management by offering any type of reasonable media buyback program.

HP: Media manufacturers and suppliers are only interested in new media because the use of any other type, especially remanufactured media, increases the risk of data loss and backup disruption.

HP quality testing examines every single batch of media on several hundred tape drives in a range of environmental conditions. This effectively means that every single tape is quality assured, since any inferior product will be intercepted long before it reaches the customer and has to be recalled. It is hard to fathom what the basis of the used tape argument is here. As a leading drive **and** media manufacturer/supplier, HP is interested in media quality that extends to the entire tape backup solution. Poor media contributes to poor customer satisfaction and high warranty costs and HP does everything it can to avoid this situation.

If a used tape dealer is paying premium prices for media of unknown heritage, then surely it must do everything it can to resell it to recoup its costs. So whose interests is it really protecting?

Used tape dealer: Using our quality recertified media will prevent costly re-runs. Experience shows that when recertifying tapes from datacenters, we typically see a 10% fallout. This means that properly recertified tape will actually decrease, not increase, the number of delays a datacenter experiences with their own non-recertified or used tapes.

HP: Whose experience? Measured by whom, where, and when? Gartner Group places the cost to the average datacenter for a job delay at \$1,000. If job delay from recertified media increased by just one a week, it will cost the datacenter more than \$50,000 in operating expenses, not including the cost of any missed Service Level Agreements (SLAs) because a job was not completed on time.

Used tape dealer: Since we remove all damaged tapes from the original lot, the buyer can be assured that the tapes were in perfect condition when they were sold. This is an additional advantage of recertified media.

HP: Handled with extreme care, under ideal conditions, most magnetic media can last more than 25 years. But experience shows that the most likely cause of a tape’s early life failure is handling damage. There is no way that this can be proved without thorough testing. Moreover, any used tape will never be as reliable or effective as a new one for reasons already stated.

Early life failure can also be attributed to a buildup of debris—caused by contamination within the datacenter, exposure to contaminants during shipping or transportation, and cross-contamination from problem cartridges. As with handling damage, the effects of this may take some time to produce problems. One small piece of debris can become embossed or “print through” to adjacent layers of media by distorting the base film.

Used tape dealer: This is true, which is why our tapes are certified on IBM, STK, Quantum, and other drives by software developed to test for errors at often better criteria than IBM/ANSI standards specify. When debris errors are detected, the cartridge is immediately removed from the recertification process. The process of recertification uses a tape scraper blade and vacuum system within a drive, which cleans the tape surface by removing debris.

HP: Given that the tape itself is only microns thick, this rather crude tape scraping process is very likely to irretrievably damage the tape surface or the servo pattern.

Error rates are key factors influencing the ability to recover data. How many more errors do you allow on a recertified cartridge compared to a newly manufactured one? How many errors define end of life for a cartridge? Recertified media could have a shorter useful life than new tapes and result in poorer performance for the entire library. It may cause system error rates to increase, triggering excessive drive service calls. For many datacenters, these excess service calls are now billable items even if basic maintenance is included in the service contract.

Used tape dealer: Our recertification process includes criteria for temporary errors. We think it is better to recertify tapes and ensure these criteria are not exceeded. With regard to "useful life," we see typical usage of media as being between one and 2,000 passes depending on the nature of the process, yet we see that manufacturers typically claim much more than this indicating to the user a large safety net. We therefore do not see "useful life" as an issue.

HP: That depends on what you mean by a pass. Here is the correct definition. A pass is any movement of the media across the drive head in either direction. A full backup of an LTO-2 tape with 512 tracks and 8 recording heads requires 64 passes.

Based on your usage model, you would only get 30 full backups from (2000/64) the media, well short of the recommended 264 backups quoted by leading vendors for this type of duty cycle. Small wonder you can be so confident about your media quality if you are recommending that your tapes are only used 30 times.

A pass could, of course, be a full end-to-end traverse of the tape, or be a reading of the log file at the beginning of a tape. A pass is not, as you seem to imply, equivalent to a full backup. In reality, as tapes are loaded many times, for different purposes and in different drives for different applications, it is not easy to get a reliable pass count. Even an absolute figure, such as the maximum number of full backups, is only notional.

Most prudent customers manage their media rotation using software and policy-based rules to avoid the risk of becoming dependent on a cartridge that is perilously close to end of life. They understand that saving a few dollars on the price of a tape is not worth the risk to their company or their career if important data assets are irretrievably lost because they used media of unknown background.

Warranties are a guarantee of quality, supported by full return and replacement provided media are kept, handled, and used according to the limits of the specification. Whatever happens to a used tape before it is certified for re-use, it does not come with a manufacturer's warranty—and there is no service history to indicate how old or worn the media actually is.

HP is not saying that recertified tapes will never work or last, but there is more than a trace of uncertainty that you will not get your data back. Is it worth the risk?

Purchasing a recertified tape

Before you purchase a recertified tape, think:

- **How and where was the media kept?** Temperature, humidity, and air quality can all affect media quality. Some chemical processes can cause pigment binders to degrade and reduce the durability of tape. In addition, this degradation can increase the amount of debris piling up to clog the read/write head later on. This can lead to data loss—**after** the cartridge has been reconditioned, recertified, and sold.
- **How has the media been handled?** Before a recertified cartridge turns up looking like new, just think what it could have been through to get there. After all, what do you do with your spent cartridges? Most people dispose of them or pack them off for recertification. After consigned to this fate, they can come in for some pretty rough handling.

New HP data cartridges are cushioned by several protective layers to prevent damage from severe shock, vibration, and environmental extremes that the package may encounter during shipping. Each cartridge is contained within a protective poly case, placed in a subcarton, and finally put into a sturdy master carton before being loaded onto palettes ready for shipping. Product packaging is routinely tested to ensure factory-validated media performance is not upset by the shipping process.

- **How was the media used?** Each tape has a specified life that relates to in-drive performance and is often measured by the number of head passes, load/unload cycles, and the number of backups. Each of these everyday activities will, to some degree, shorten the life of the product. Aggressive tape motion—for example, frequent start stops, tension drops during direction changes, or high-speed searching—could also damage the tape surface and the tape edge. If the tape edge is damaged, it cannot be repaired through re-conditioning and may ultimately result in a poorer performing product. In an everyday backup environment, the tape edge will contribute to error rates long before the media itself wears out. A high error rate can lead to slower transfer rates, reduced cartridge capacity, and ultimately backup/restore failure.

New media versus recertified media

Table. 1. Example of new media versus recertified media

	Recertified	New
Expected archival life	Unknown	15–30 years—verified by accelerated real-life testing in HP labs.
Care and handling history	Unknown	Drop tested in HP labs. Packaged immediately to arrive in perfect condition.
Environmental history	Unknown	Tested to extremes of temperature and humidity in HP labs.
Amount of surface debris	Unknown	None. HP cartridges are triple sealed in a carton before shipping.
Quality control processes	Unclear	Exhaustive verification, including more than 170,000 separate tests and more than a million test hours a year.
Warranty and technical support	No manufacturer’s warranty No after-sales technical support	Limited lifetime warranty and one-stop, world-class customer support.

To be certain of your data, buy the brand that is new

HP scrutinizes every single batch of HP media, in real-life conditions, on many drives. HP is a leader in both hardware and media for all the mainstream tape technologies. No one understands more about how to optimize the performance of complete backup solutions.

All HP Ultrium media undergo an exhaustive battery of procedures that relate directly to how the product is used in the workplace, when actual data and businesses are at stake. HP uses many drives and media to be sure its results are consistent for any combination, rather than a narrower, custom test on just one drive and cartridge. The program includes more than 170,000 separate tests accounting for more than a million test hours a year, pushing the technology to its limits in the most extreme conditions of temperature, altitude, and humidity.

Whatever the conditions, HP media can be relied on for accurate backup and restore, time and time again, day in, day out.